(19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 9 June 2005 (09.06.2005)

PCT

(10) International Publication Number WO 2005/052316 A2

(51) International Patent Classification⁷:

E21D

(74) Agents: WAIN, Christopher, Paul et al.; A.A. Thornton & Co., 235 High Holborn, London WC1V 7LE (GB).

(21) International Application Number:

PCT/GB2004/004742

(22) International Filing Date:

10 November 2004 (10.11.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10/714,831

14 November 2003 (14.11.2003) US

- (71) Applicant (for all designated States except US): HAL-LIBURTON ENERGY SERVICES, INC. [US/US]; P.O. Box 1431, Duncan, OK 73533 (US).
- (71) Applicant (for MW only): WAIN, Christopher, Paul [GB/GB]; A.A. Thornton & Co., 235 High Holborn, London WC1V 7LE (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): STEVENS, Michael, D. [US/US]; Rt. 3 Box 38, Duncan, OK 73533 (US). WEBB, Earl, D. [US/US]; P.O. Box 87, Wilson, OK 73463 (US). SZARKA, David, D. [US/US]; Rt. 2, Box 222, Duncan, OK 73533 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

ZW.

without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MOLDED FOAM PLUGS, PLUG SYSTEMS AND METHODS OF USING SAME

(57) Abstract: The present invention is directed to plugs, plug systems and methods for using the plugs and systems in subterranean wells. The plugs comprise an inner mandrel and an outer sleeve formed of a compressible foam. The plug systems include an assembly comprising a top plug and a bottom plug having foam outer sleeves. The plug systems further comprise a float valve into which the assembly fits. In the method, the bottom plug is deployed ahead of the top plug to separate a second fluid from a first fluid and wipe the inside of the pipe string clean of the first fluid. The top plug is used to wipe the inside of the pipe string clean of the second fluid and stop the displacement of the second fluid into the annulus between the casing string and the well bore.

